

LOWER SNAKE RIVER COMPENSATION PLAN:
Summer Steelhead Creel Surveys on the
Grande Ronde, Wallowa, and Imnaha
Rivers for the 2000-01 Run Year

Oregon Department of Fish and Wildlife
Fish Research and Development, NE Region



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March 2004



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ANNUAL PROGRESS REPORT

FISH RESEARCH PROJECT
OREGON

PROJECT TITLE: Summer Steelhead Creel Surveys on the
Grande Ronde, Wallowa, and Imnaha
Rivers for the 2000-01 Run Year

AGREEMENT NUMBER: 14110-3-J050

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This project was financed by the U.S. Fish and Wildlife Service under the Lower Snake
River Compensation Plan.

PREFACE

The sampling period was from 1 September 2000 to 15 April 2001. The report summarizes statistical angler surveys conducted during the summer steelhead angling season in major fishing areas on the Grande Ronde, Wallowa, and Imnaha Rivers. Hatchery adult steelhead harvested during the 2000-2001 run year were primarily from the 1997 and 1998 brood years. Results of creel surveys conducted prior to fall 2000 are reported in previous Lower Snake River Compensation Plan evaluation annual reports (Carmichael et al. 1986, 1987, 1988, 1989, 1990; Flesher et al. 1991, 1992, 1993, 1994, 1995, 1996, 1997, 1999, 2000, 2001). The steelhead angling season surveyed in this report, during which only adipose fin-clipped fish could be kept, was open from 1 September 2000 to 15 April 2001 in the Grande Ronde and Imnaha River basins.

ACKNOWLEDGMENTS

We would like to thank Dan Herrig for his review of the report, Mary Buckman for the statistical design and analysis of the data, and Catherine Broyles and Rodger Johnson for their dedication in conducting the surveys. We would also like to thank Joe Bumgarner (Washington Department of Fish and Wildlife) for coordination and John Johnston for conducting the Lower Grande Ronde survey during spring, 2001. This project was financed as a cooperative agreement between the Oregon Department of Fish and Wildlife and the U.S. Fish and Wildlife Service under the Lower Snake River Compensation Plan.

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SUMMARY

Angler effort, catch and harvest during the 2000-01 run year on the lower Grande Ronde River was higher than the previous year and was also the highest observed since we began surveys during the 1985-86 run year. On the Imnaha River, angler effort was lower, harvest was similar, but catch was higher than the previous year. Catch rates were higher than the previous year in all fisheries in the Grande Ronde and Imnaha basins, with the catch rate on the lower Grande Ronde River being the highest observed since surveys began. Hatchery summer steelhead dominated the catch in 13 of the 20 months surveyed in the Grande Ronde and Imnaha River basin fisheries. Anglers harvested more one-ocean than to two-ocean hatchery steelhead and more females than males in both the Grande Ronde and Imnaha fisheries. The percentage of anglers from Oregon counties other than Union or Wallowa (local anglers) was higher than average and accordingly, the percentage of local anglers was lower than average in summer steelhead fisheries during the 2000-01 run year. We sampled adipose fin-clipped and left ventral fin-clipped plus coded-wire-tagged (AdLV+CWT) summer steelhead in both the Grande Ronde and Imnaha basin fisheries, except at Rondowa and the upper Grande Ronde River. Expanded estimates for the Wallowa and Rondowa fisheries will not be determined until statewide annual harvest card (tag) summaries become available.

INTRODUCTION

Summer steelhead (*Oncorhynchus mykiss*) fisheries in the Grande Ronde and Imnaha basins were closed in 1974. This closure was prompted by declining adult returns, as indicated by adult counts at Ice Harbor Dam on the Snake River (U.S. Army Corps of Engineers 1996) and low steelhead redd counts on index streams in the Grande Ronde and Imnaha basins (Oregon Department of Fish and Wildlife District Annual Reports 1949-1974). The Lower Snake River Compensation Plan (LSRCP), initiated by Congress in 1976, was developed to compensate for losses of anadromous salmonids in the Snake River basin from construction of the four lower Snake River Dams built between 1962 and 1976. Thus, the focus of the LSRCP is above Lower Granite Dam (Rkm 173), the uppermost of the four lowest dams on the Snake River. One of the primary objectives of the LSRCP in Oregon is to restore historic recreational and tribal fisheries for summer steelhead in the Grande Ronde and Imnaha basins (Carmichael 1989). Approximately 1.68 million steelhead smolts have been released in Oregon each year during April and May in the Grande Ronde and Imnaha basins until 2000, when we reduced releases to approximately 1.2 million smolts. This reduction was implemented due to a National Oceanic and Atmospheric Administration (NOAA) Fisheries' recommendation to help reduce straying of Wallowa hatchery stock steelhead, primarily into the Deschutes River (mid-Columbia tributary). These fish provide hatchery adult returns that contribute to recreational fisheries and may supplement natural spawning populations in northeast Oregon. Consumptive recreational fisheries for summer steelhead re-opened in 1986, in part as a result of increases in hatchery adult returns.

We began creel surveys for summer steelhead during the fall of 1985 in both the Grande Ronde and Imnaha basins. The goal of these surveys is to provide annual harvest information needed to assess LSRCP compensation goals (Carmichael and Wagner 1983). In general, the number of summer steelhead in the recreational fishery has been restored to historic values, but the fishery is concentrated at different times and places (Fletcher et al. 1994). This report summarizes results of creel surveys conducted during the fall of 2000 and the spring of 2001 in the Grande Ronde and Imnaha basins. In addition, this report contains estimates of total effort, catch, and harvest for all fisheries in the Grande Ronde and Imnaha basins not reported in previous annual reports for the 1996-97 to 1999-2000 run years. The Grande Ronde and Imnaha basins encompass the major steelhead fisheries in Oregon streams that drain into the Snake River upstream of Lower Granite Dam.

STUDY AREA

Creel surveys on the Grande Ronde River were conducted on a lower 24 km section from the Oregon-Washington state line (Rkm 62) upstream to Wildcat Creek (Rkm 86) and an upper 39 km section from the Highway 82 bridge at Island City (Rkm 256) upstream to Meadow Creek (Rkm 295; Figure 1). Surveys on the Wallowa River were conducted on a 6 km section from its confluence with the Grande Ronde River at Rondowa (mouth of the Wallowa River) upstream to Howard Creek (Rkm 6) and a 50 km section from Minam State Park (Rkm 13) upstream to the mouth of Trout Creek (Rkm 63) near Enterprise. Anglers who parked their vehicles at Minam State Park to fish just below the park were included in the survey. Because vehicle access into Rondowa was limited, most anglers parked their vehicles at Palmer Junction, located 5.6 km upstream of Rondowa on the Grande Ronde River. Thus, for the Rondowa survey, we interviewed anglers leaving the parking area at Palmer Junction. The survey on the Imnaha River was conducted on the lower 32 km from its confluence with the Snake River (Rkm 0) upstream to the mouth of Big Sheep Creek (Rkm 32) near the town of Imnaha (Figure 1).

METHODS

For the lower Grande Ronde River survey, we used the methodology described by Carmichael et al. (1988). We sampled 50% of the weekend days (Saturday and Sunday) and holidays (37 total days sampled) and 30% of the weekdays (Monday through Friday, 48 total days sampled) during each month of each survey. Initially, sample days were chosen randomly in two-day blocks. They were then adjusted to equally represent days within two time periods (weekend days and holidays, and weekdays). Each sample day, beginning at a randomly selected start time, the creel surveyor conducted a pressure count by tallying all anglers and vehicles every three hours while driving a vehicle along the entire survey route. Between pressure counts, the surveyor interviewed anglers by recording a description of each angler, their residence, the number of hours fished, and the number and species caught. The

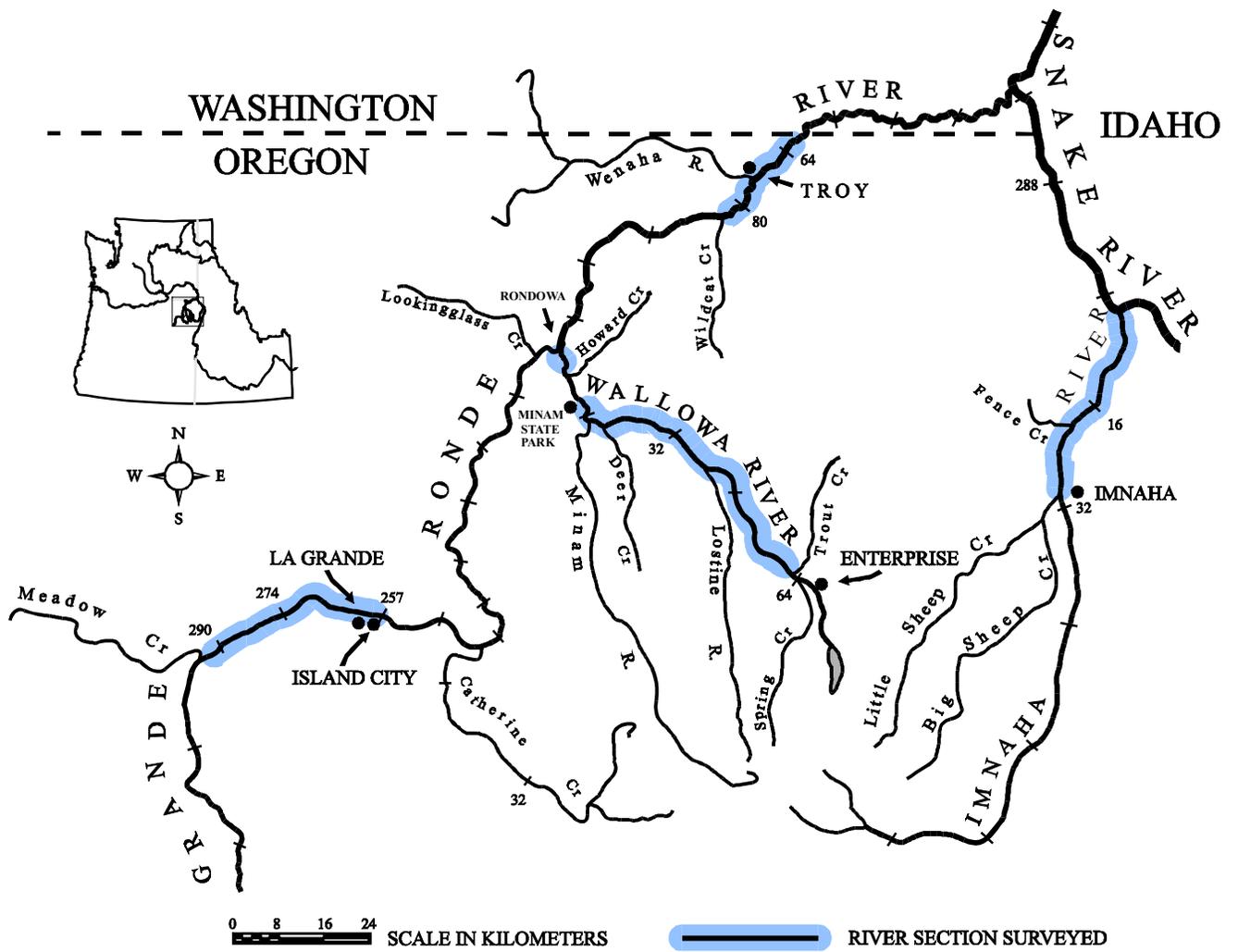


Figure 1. Map of northeastern Oregon showing where summer steelhead creel surveys were conducted in the Grande Ronde and Imnaha basins during the 2000-01 run year.

surveyor also sampled all harvested fish by recording fork length (mm), sex, fin clip, and any external tags. If the fish was coded-wire-tagged (CWT), as indicated by an adipose fin-clip and left ventral fin-clip (AdLV), the surveyor asked permission from the angler, then excised the snout behind the eye and placed it with an identification number in a plastic bag for later processing. For the Imnaha River survey, we used a check station for the area below Fence Creek (Rkm 23) and a roving survey in the area above Fence Creek. The check station was designed so that anglers leaving the lower river area during a sample day would stop voluntarily and the surveyor would interview each angler and sample all harvested fish. At the end of the second sample day, the surveyor would drive to Cow Creek (Rkm 7) and interview all anglers encountered that fished that day and those that fished the previous sample day. For the roving survey we followed the same procedures as on the lower Grande Ronde River survey except that the surveyor interviewed anglers during pressure counts. For each pressure count the surveyor closed the check station, interviewed and enumerated all anglers from Fence Creek to the town of Imnaha, and returned. Time spent away from the check station was recorded and later expanded.

For the upper Grande Ronde River, Rondowa, and Wallowa River survey areas, one surveyor conducted angler interviews from 1 February to 15 April 2001. We randomly selected survey areas and a minimum of two areas were surveyed each sample day. Each sample day, the surveyor drove the survey route, stopped to interview anglers, then drove to the next area and repeated this sequence. If sufficient time was available, the surveyor included and interviewed anglers in a third area. All harvested fish observed were sampled. We sampled 87% of the weekends and holidays and 43% of the weekdays. From 1 February to 3 March, we surveyed five days each week from 0800-1700. From 4 March to 15 April, we surveyed four days each week from 0700-1800.

During the lower Grande Ronde and Imnaha river creel surveys, we estimated angler effort in hours and days, total catch, harvest, catch rate, percent hatchery fish in the catch, and the number of AdLV+CWT marked fish harvested (see Carmichael et al. 1988). In all other areas, we estimated catch rate and percent hatchery fish in the catch. In addition, we determined age and sex composition and mean fork length of harvested fish in all survey areas. Catch rate was expressed as an index, hours per fish, in which lower values indicate better angling success and higher values indicate poorer angling success. The survey on the lower Grande Ronde River was from 1 September 2000 to 15 April 2001. Surveys on the upper Grande Ronde, Wallowa, and Imnaha Rivers, and Rondowa were from 1 February to 15 April 2000.

We estimated total harvest by month for previous spring fisheries in the Grande Ronde and Imnaha basins (1996-97 to 1999-2000 run years) using the relationship between angler harvest tag (punch card) harvest and creel survey harvest for specific reaches within each basin (see Flesher et al. 1996). For estimating total catch, we used total harvest multiplied by the ratio of sampled catch to sampled harvest. To estimate total angler effort in hours, we used total catch divided by the sample catch rate (fish per

hour) reported in previous annual reports (see Flesher et al. 1997, 1999, 2000, and 2001).

ACCOMPLISHMENTS AND FINDINGS

On the lower Grande Ronde River, we sampled an average of 50.7% of the weekends and holidays and 31.2% of the weekdays each month for a total of 85 sample days. On the upper Grande Ronde River, we sampled an average of 73.9% of the weekends and holidays and 43.1% of the weekdays each month for a total of 39 sample days. On the Wallowa River, we sampled an average of 87.0% of the weekends and holidays and 37.3% of the weekdays each month for a total of 39 sample days. On the Imnaha River, we sampled an average of 65.2% of the weekends and holidays and 35.3% of the weekdays each month for a total of 33 sample days.

We estimated that 4,085 anglers fished for 20,166 hours on the lower Grande Ronde River. They caught and released 1,240 wild and 619 hatchery steelhead and kept 1,417 hatchery steelhead for a catch rate index of 6 hours per fish (Figures 2-6, Appendix Table A-1). The percent of steelhead caught that were hatchery origin ranged from 2% in April 2001 to 75% in January 2001 (Figure 7, Appendix Table A-7). Age composition of harvested hatchery steelhead was 50% 1:1's (one year spent in freshwater: one year spent in saltwater) and 50% 1:2's (one year spent in freshwater: two years spent in saltwater). Mean fork length ($\pm 95\%$ confidence interval) of harvested hatchery steelhead was 607 (± 5) mm for 1:1's and 720 (± 7) mm for 1:2's (Table 1). Sex composition was 45% male and 55% female (Table 1). Seventy-two percent of the anglers were from Union or Wallowa counties, 17% were from other Oregon counties, 5% were Washington State residents and 6% resided outside the states of Oregon and Washington (Table 2). On the lower Grande Ronde River, anglers harvested an estimated 58 AdLV+CWT marked steelhead from our hatchery releases and an estimated 28 AdLV+CWT marked steelhead that were from Washington Department of Fish and Wildlife releases on the Grande Ronde River at the Cottonwood Conditioning Pond, Washington (Table 3).

On the upper Grande Ronde River, the catch rate index averaged 18 hours per fish (Figure 4, Appendix Table A-2). The percent of steelhead caught that were hatchery origin ranged from 0% in March to 67% in April (Figure 7, Appendix Table A-7). Age composition of harvested hatchery steelhead was 33% 1:1's and 67% 1:2's. Mean fork length ($\pm 95\%$ confidence interval) of harvested hatchery steelhead was 600 mm for a 1:1 and 720 (± 254) mm for 1:2's (Table 1). Sex composition was 33% male and 67% female (Table 1). Eighty-seven percent of the anglers were from Union or Wallowa counties, 12% were from other Oregon counties and 1% resided outside the states of Oregon and Washington (Table 2).

At Rondowa, the catch rate index averaged 6 hours per fish (Figure 4, Appendix Table A-3). The percentage of steelhead caught that were hatchery origin ranged from

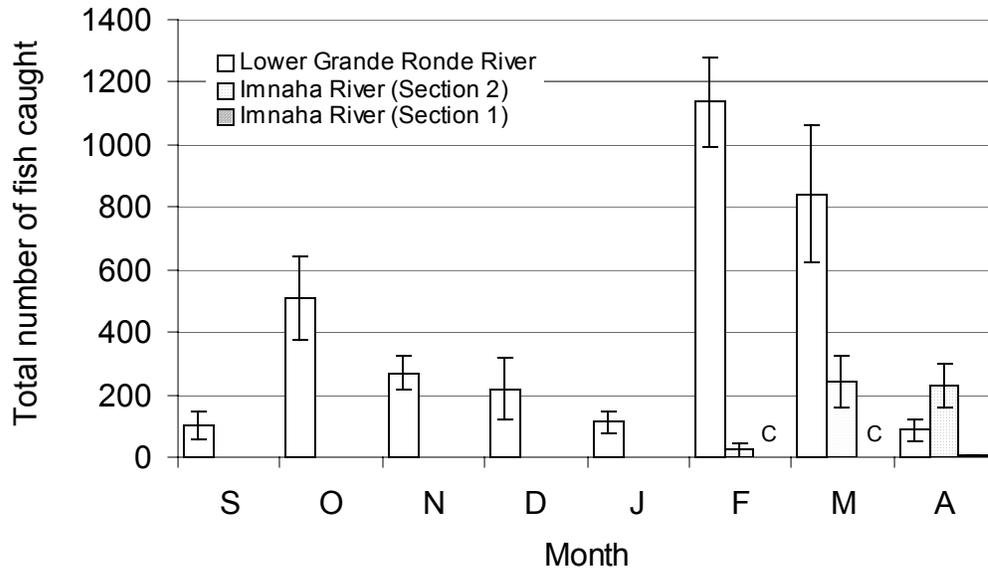


Figure 2. Estimated total catch of summer steelhead ($\pm 95\%$ confidence intervals) on the lower Grande Ronde River and two sections of the Imnaha River during the 2000-01 run year. C indicates no catch. Surveys were conducted from 1 September 2000 to 15 April 2001 on the lower Grande Ronde River and from 1 February to 15 April 2001 on the Imnaha River.

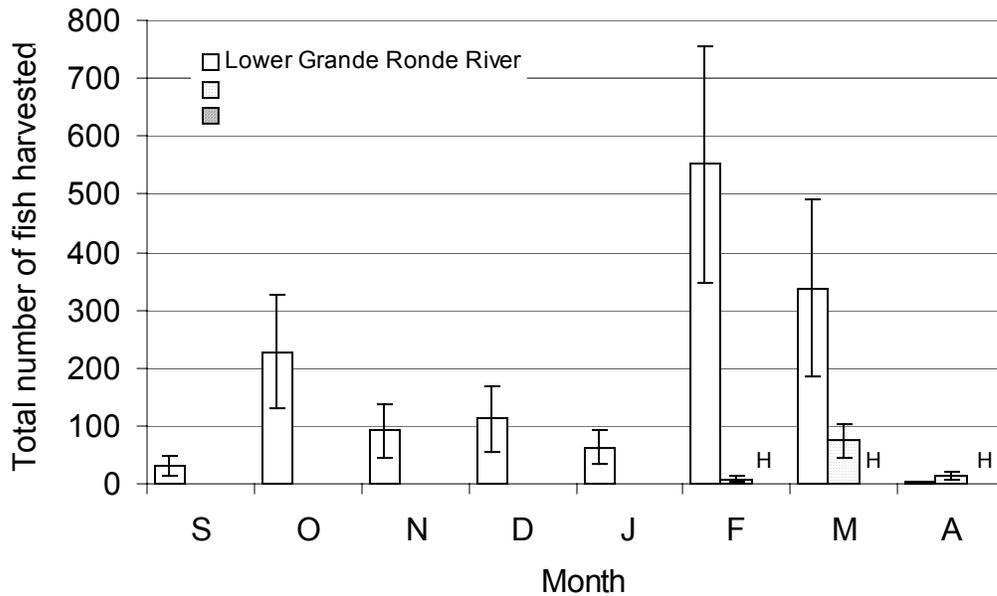


Figure 3. Estimated total harvest of summer steelhead ($\pm 95\%$ confidence intervals) on the lower Grande Ronde River and two sections of the Imnaha River during the 2000-01 run year. H indicates no harvest. Surveys were conducted from 1 September 2000 to 15 April 2001 on the lower Grande Ronde River and from 1 February to 15 April 2001 on the Imnaha River.

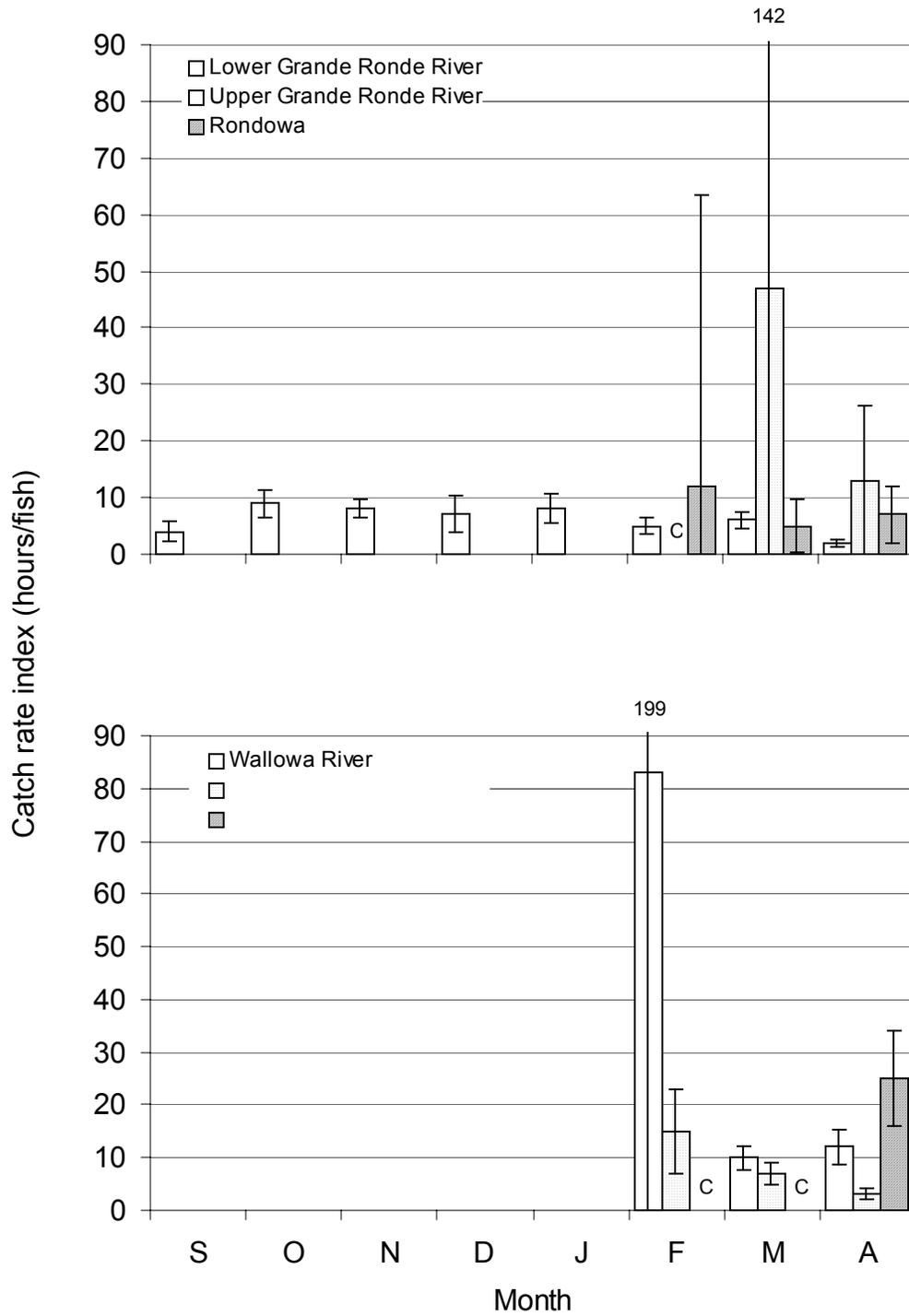


Figure 4. Estimated catch rate index (hours/fish) for summer steelhead ($\pm 95\%$ confidence intervals) in the Grande Ronde and Imnaha basins during the 2000-01 run year. C indicates no catch. Survey areas and times include the lower Grande Ronde River (1 September-to 15 April), upper Grande Ronde River, Rondowa, Wallowa River, and two sections of the Imnaha River (1 February-15 April). Note: A lower catch rate index implies better angling success.

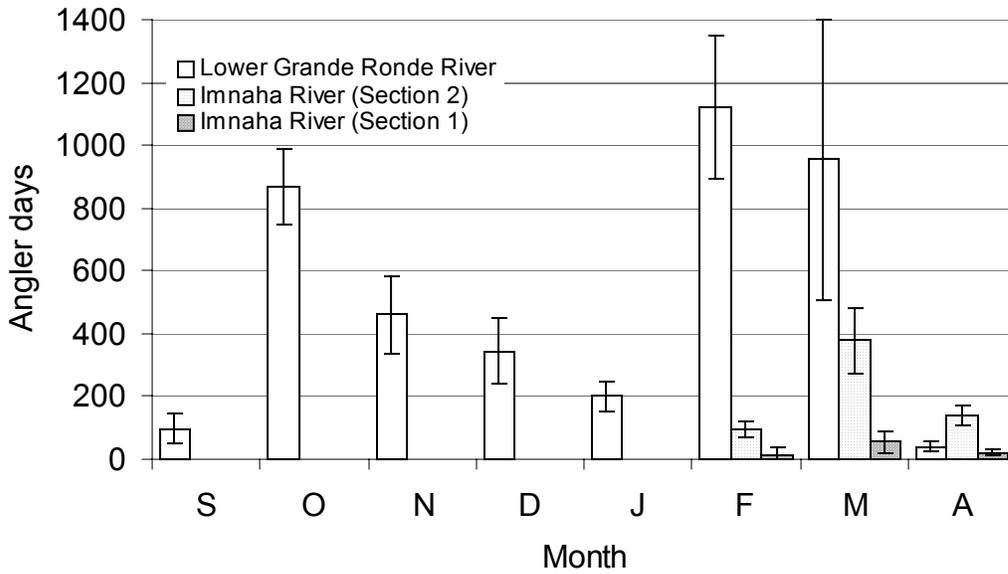


Figure 5. Estimated number of angler days for summer steelhead ($\pm 95\%$ confidence intervals) on the lower Grande Ronde River and two sections of the Imnaha River during the 2000-01 run year. Surveys were conducted from 1 September 2000 to 15 April 2001 on the lower Grande Ronde River and from 1 February to 15 April 2001 on the Imnaha River.

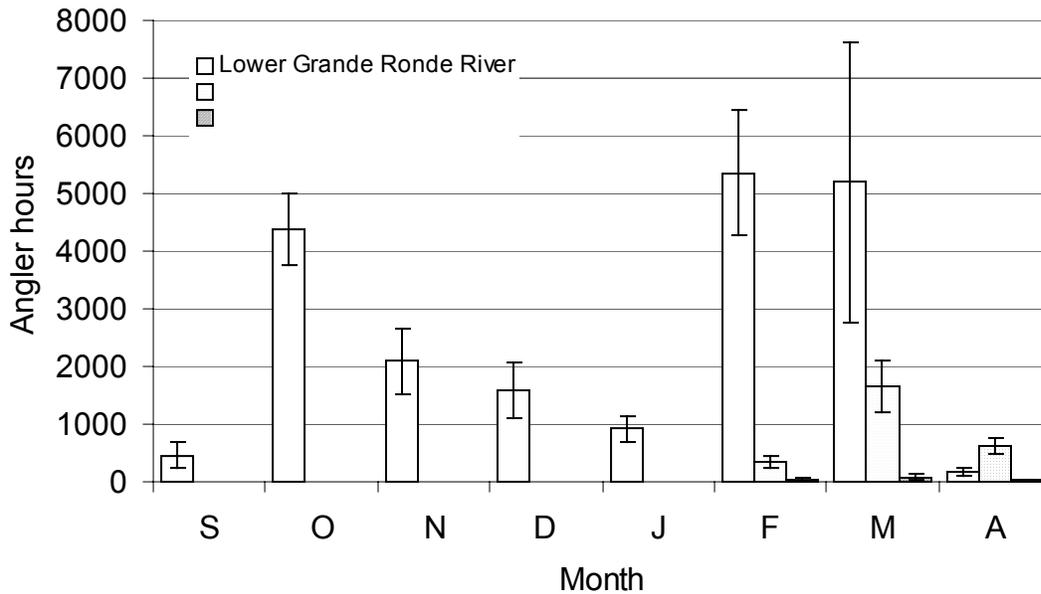


Figure 6. Estimated number of angler hours for summer steelhead ($\pm 95\%$ confidence intervals) on the lower Grande Ronde River and two sections of the Imnaha River during the 2000-01 run year. Surveys were conducted from 1 September 2000 to 15 April 2001 on the lower Grande Ronde River and from 1 February to 15 April 2001 on the Imnaha River.

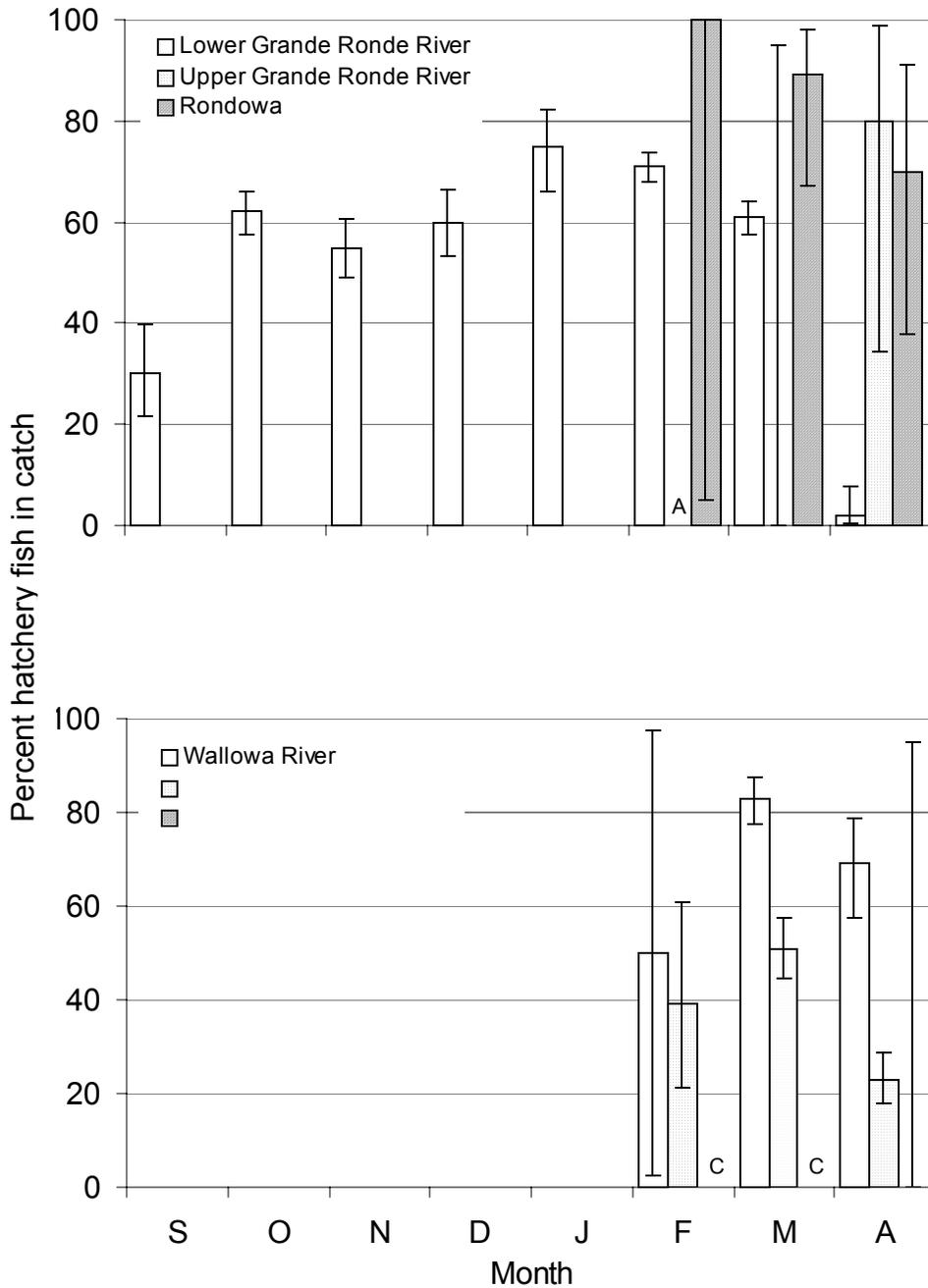


Figure 7. Estimated percent of summer steelhead caught ($\pm 95\%$ confidence intervals; using a binomial distribution) in the Grande Ronde and Imnaha basins during the 2000-2001 run year that were hatchery fish. A indicates no anglers and C indicates no catch. Survey areas and times include the lower Grande Ronde River (1 September-to 15 April), upper Grande Ronde River, Rondowa, Wallowa River, and two sections of the Imnaha River (1 February-15 April).

Table 1. Percent age composition and mean fork length of hatchery summer steelhead sampled in creel surveys in the Grande Ronde and Imnaha basins during the 2000-01 run year. Age composition and mean fork length by age estimated from fork lengths of harvested fish and age-length keys developed from hatchery returns to Wallowa Fish Hatchery and Little Sheep Creek Facility (for the Imnaha River survey area) in 2001. Age is expressed as years spent in freshwater prior to ocean migration: years spent in the ocean prior to spawning migration. Mean fork length includes $\pm 95\%$ confidence intervals.

Creel survey area, sex	N	Age composition (%)		Mean fork length (mm)	
		1:1	1:2	1:1	1:2
Lower GR River					
Males	119	71	29	612 \pm 7	733 \pm 15
Females	147	33	67	597 \pm 9	715 \pm 9
Total	266	50	50	607 \pm 5	720 \pm 7
Upper GR River					
Males	1	0	100	--	740
Females	2	50	50	600	700
Total	3	33	67	600	720 \pm 254
Rondowa					
Males	9	66	34	597 \pm 43	713 \pm 94
Females	8	36	64	593 \pm 80	712 \pm 43
Total	17	53	47	596 \pm 28	713 \pm 28
Wallowa River					
Males	79	73	27	618 \pm 8	735 \pm 26
Females	79	49	51	593 \pm 9	711 \pm 14
Total	158	61	39	608 \pm 7	719 \pm 13
Imnaha River					
Males	15	93	7	600 \pm 10	710
Females	32	78	22	579 \pm 13	680 \pm 45
Total	47	83	17	586 \pm 9	684 \pm 38

Table 2. Residence (%) of summer steelhead anglers interviewed during creel surveys in the Grande Ronde and Imnaha basins during the 2000-01 run year.

Creel survey area	Number of anglers	Angler residence (%)			
		Union or Wallowa counties	Other Oregon counties	Washington	Other states
Lower GR River	1144	72	17	5	6
Upper GR River	77	87	12	0	1
Rondowa	40	62	38	0	0
Wallowa River	1124	63	33	1	3
Imnaha River	349	89	6	2	3

Table 3. Number of AdLV+CWT marked summer steelhead recovered during creel surveys in the Grande Ronde and Imnaha basins during the 2000-01 run year. No AdLV+CWT marked fish were recovered at Rondowa or in the upper Grande Ronde River. Recoveries were expanded for the entire fishery.

Creel survey area	Tag code	Release site	Experimental group ^a	Brood year	Number recovered	
					Observed	Expanded ^b
Lower Grande Ronde River	07 12 47	Spring Cr.	Lyons Ferry	97	1	4
	09 23 29	Spring Cr.	Volitional/April	97	2	10
	09 23 26	Deer Cr.	Forced/April	97	1	6
	09 23 31	Deer Cr.	Forced/May	97	1	2
	09 25 62	Deer Cr.	Volitional/April	98	1	8
	09 25 63	Deer Cr.	Forced/April	98	1	6
	09 26 03	Deer Cr.	Volitional/May	98	1	3
	09 26 01	Spring Cr.	Forced/April	98	2	9
	09 26 02	Spring Cr.	Volitional/April	98	1	4
	09 26 06	Spring Cr.	Forced/May	98	1	6
	63 61 27	--	WDFW ^c	97	1	6
	63 04 60	--	WDFW ^c	98	4	22
	Wallowa River	09 23 27	Deer Cr.	Volitional/April	97	1
09 25 62		Deer Cr.	Volitional/April	98	1	ND
09 26 04		Deer Cr.	Forced/May	98	1	ND
Imnaha River	07 48 60	L. Sheep Cr.	1/4 density	97	1	2
	09 23 22	L. Sheep Cr.	1/2 density	97	1	2
	09 23 23	L. Sheep Cr.	1/2 density	97	1	2
	09 25 60	L. Sheep Cr.	Graded large	98	3	9
	09 26 34	L. Sheep Cr.	Graded medium	98	2	8

^a Lyons Ferry indicates group was reared at Lyons Ferry Fish Hatchery in Washington, then hauled and released with the Forced/April group in Spring Creek. 1/4 and 1/2 density indicates either 1/4 or 1/2 of the standard rearing density (22 kg/cu m) in raceways at Irrigon Hatchery prior to release.

^b ND indicates expansions not determined until statewide annual harvest card data become available.

^c Steelhead with tag codes 63 61 27 and 63 04 60 were released by Washington Department of Fish and Wildlife (WDFW) in the lower Grande Ronde River at the Cottonwood Conditioning Pond, Washington, on 1 April 1998 and 15 April 1999, respectively.

70% in April to 100% in February (Figure 7, Appendix Table A-7). Age composition of harvested hatchery steelhead was 53% 1:1's and 47% 1:2's. Mean fork length ($\pm 95\%$ confidence interval) of harvested hatchery steelhead was 596 (± 28) mm for 1:1's and 713 (± 28) mm for 1:2's (Table 1). Sex composition was 53% male and 47% female (Table 1). Sixty-two percent of the anglers were from Union or Wallowa counties and 38% were from other Oregon counties (Table 2). Anglers did not harvest any AdLV+CWT marked steelhead from our hatchery releases at Rondowa (Table 3).

On the Wallowa River, the catch rate index averaged 11 hours per fish (Figure 4, Appendix Table A-4). The percentage of steelhead caught that were hatchery origin ranged from 50% in February to 83% in March (Figure 7, Appendix Table A-7). Age composition of harvested hatchery steelhead was 61% 1:1's and 39% 1:2's. Mean fork

length ($\pm 95\%$ confidence interval) of harvested hatchery steelhead was 608 (± 7) mm for 1:1's and 719 (± 13) mm for 1:2's (Table 1). Sex composition was 50% male and 50% female (Table 1). Sixty-three percent of the anglers were from Union or Wallowa counties, 33% were from other Oregon counties, 1% were Washington State residents and 3% resided outside the states of Oregon and Washington (Table 2). On the Wallowa River, anglers harvested 3 AdLV+CWT marked steelhead from our hatchery releases, however, expanded estimates for the entire fishery will not be determined until state harvest tag data become available (Table 3).

On the Imnaha River, we estimated that 704 anglers fished for 2,747 hours. They caught and released 309 wild and 86 hatchery steelhead and kept 97 hatchery steelhead for a catch rate index of 6 hours per fish (Figures 2-6, Appendix Tables A-5 and A-6). The percentage of steelhead caught that were hatchery origin ranged from 0% in April in Section 1 to 51% in March in Section 2 (Figure 7, Appendix Table A-7). Age composition of harvested hatchery steelhead was 83% 1:1's and 17% 1:2's. Mean fork length ($\pm 95\%$ confidence interval) of harvested hatchery steelhead was 586 (± 9) mm for 1:1's and 684 (± 38) mm for 1:2's (Table 1). Sex composition was 32% male and 68% female (Table 1). Eighty-nine percent of the anglers were from Union or Wallowa counties, 6% were from other Oregon counties, 2% were Washington State residents and 3% resided outside the states of Oregon and Washington (Table 2). On the Imnaha River, anglers harvested an estimated 23 AdLV+CWT marked steelhead from our hatchery releases (Table 3).

Angler effort (Figure 8) was 191% and harvest (Figure 9) was 182% of the previous year on the lower Grande Ronde River, and was also the highest observed since surveys began during the 1984-85 run year. On the Imnaha River, angler effort was 71% and harvest was 99% of the previous year. Catch rates in both the Grande Ronde and Imnaha basins improved over the previous year by 149% and 200%, respectively, with the catch rate on the lower Grande Ronde being the highest observed since surveys began (Table 4). The best catch rate index observed was in April on the Lower Grande Ronde River (2 hours/fish), while the poorest catch rate was in February on the Wallowa River (83 hours/fish). The residence of anglers participating in summer steelhead fisheries in the Grande Ronde and Imnaha basins was similar to the previous year, with 22 percent of the anglers coming from Oregon counties other than Union and Wallowa (Figure 10). The fishery at Rondowa had the highest percentage (38%) of non-local Oregon anglers. The percentage of anglers from other states (7%) was similar to the previous year.

We estimated total harvest and harvest of AdLV+CWT marked steelhead for previous spring steelhead fisheries (upper Grande Ronde, Wallowa, and Imnaha rivers, Rondowa, and Catherine Creek) for the 1996-97 through 1999-2000 run years (Figure 9, Appendix Tables B-1 to B-4) using the relationship between punch card (angler tag) harvest and creel survey harvest for years when these harvest estimates for specific reaches were available (Figure 11). From total harvest estimates, we calculated total catch (Appendix Tables B-5 to B-8), and total angler effort in hours (Figure 8, Appendix Tables B-9 to B-12) for previous spring steelhead fisheries.

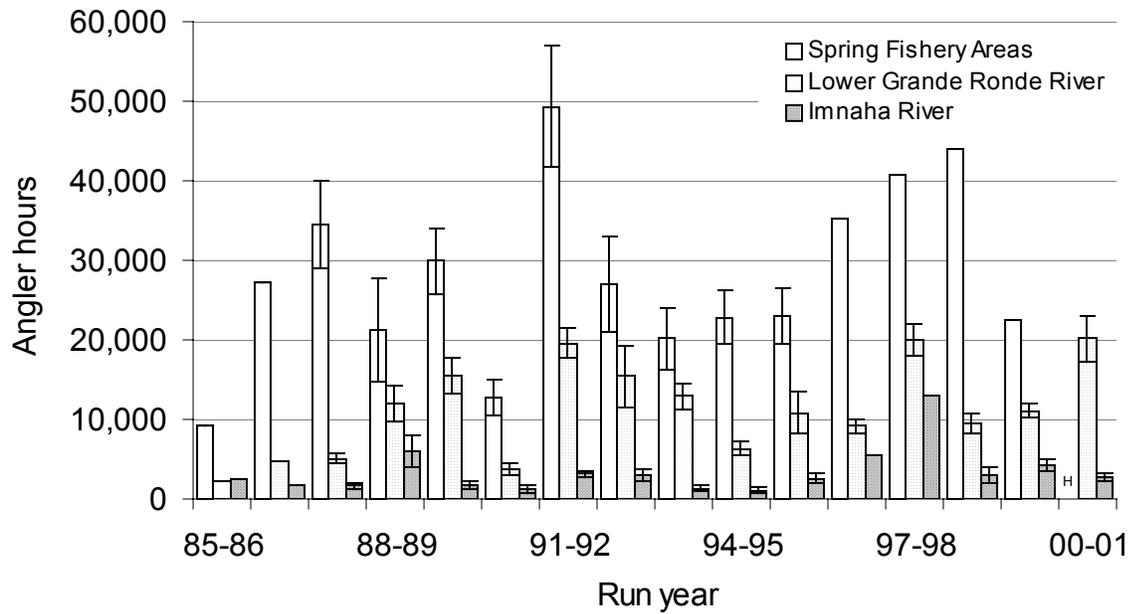


Figure 8. Angler effort for summer steelhead ($\pm 95\%$ confidence intervals) in spring fishery areas (upper Grande Ronde River, Wallowa River, Catherine Creek, and Rondowa), the lower Grande Ronde River, and the Imnaha River for the 1985-86 to 2000-2001 run years. H indicates this value must be estimated from harvest card data, which was not available when this report was submitted. Confidence intervals not available for the 85-86 and 86-87 run years, the Imnaha fishery for the 96-97 and 97-98 run years, and for spring fishery areas beginning with the 96-97 run year.

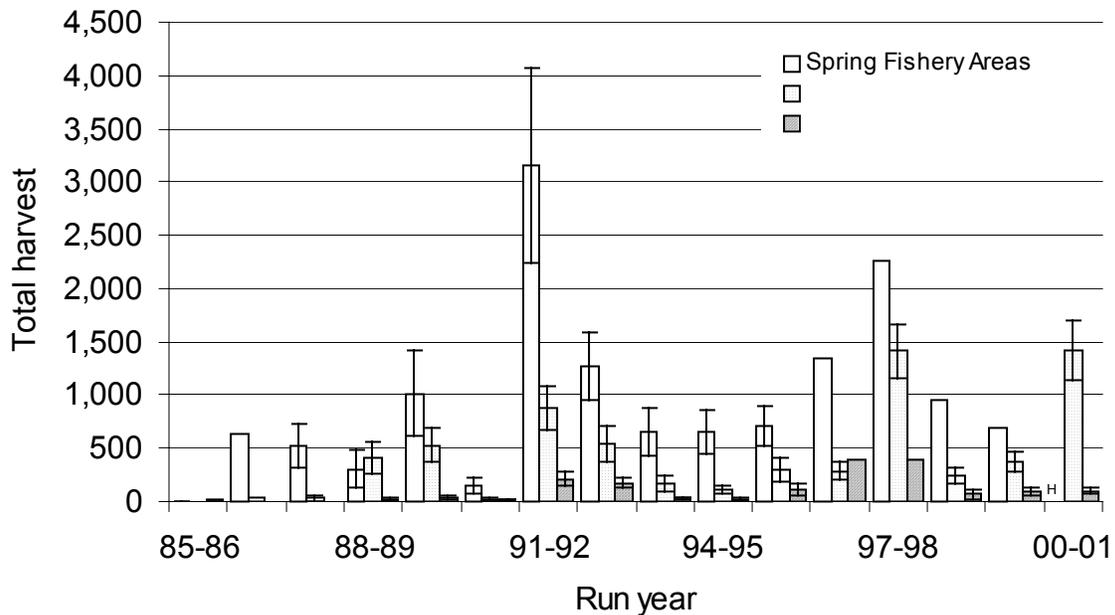


Figure 9. Number of hatchery summer steelhead harvested ($\pm 95\%$ confidence intervals) by recreational anglers in spring fishery areas (upper Grande Ronde River, Wallowa River, Catherine Creek, and Rondowa), the lower Grande Ronde River, and the Imnaha River for the 1985-86 to 2000-01 run years. H indicates this value must be estimated from harvest card data, which was not available when this report was submitted. Confidence intervals not available for the 85-86 and 86-87 run years, the Imnaha fishery for the 96-97 and 97-98 run years, and for spring fishery areas beginning with the 96-97 run year.

Table 4. Catch rate index (hours/fish \pm 95% confidence intervals) in summer steelhead fisheries creel survey areas in the Grande Ronde and Imnaha basins for the 1985-86 to 2000-01 run years. Note that a lower catch rate index implies greater angling success. "--" indicates not sampled or undefined.

Run year	Catch rate index (hours/fish)					
	Lower GR River	Upper GR River	Catherine Creek	Rondowa	Wallowa River	Imnaha River
85-86	8 \pm 7	--	--	--	7 \pm 7	15 \pm 7
86-87	9 \pm 3	--	--	--	11 \pm 3	9 \pm 8
87-88	10 \pm 4	--	--	11 \pm 9	16 \pm 3	24 \pm 9
88-89	14 \pm 4	40 \pm 55	--	--	43 \pm 21	18 \pm 11
89-90	14 \pm 4	14 \pm 8	--	34 \pm 27	17 \pm 5	20 \pm 8
90-91	19 \pm 8	24 \pm 11	--	--	6 \pm 2	13 \pm 6
91-92	11 \pm 3	10 \pm 3	3 \pm 3	6 \pm 1	10 \pm 2	4 \pm 1
92-93	9 \pm 2	14 \pm 4	49 \pm 49	--	11 \pm 2	8 \pm 1
93-94	18 \pm 5	31 \pm 17	--	12 \pm 4	17 \pm 3	13 \pm 3
94-95	21 \pm 6	25 \pm 13	--	15 \pm 5	17 \pm 3	17 \pm 8
95-96	11 \pm 2	15 \pm 4	--	--	21 \pm 4	7 \pm 2
96-97	14 \pm 4	18 \pm 9	33 \pm 69	--	13 \pm 3	6 \pm 2
97-98	7 \pm 1	13 \pm 9	7 \pm 10	11 \pm 6	10 \pm 1	18 \pm 9
98-99	17 \pm 4	19 \pm 9	14 \pm 20	--	18 \pm 4	20 \pm 7
99-2000	11 \pm 2	25 \pm 19	--	8 \pm 7	17 \pm 4	12 \pm 3
2000-01	6 \pm 1	18 \pm 17	--	6 \pm 4	11 \pm 2	6 \pm 1

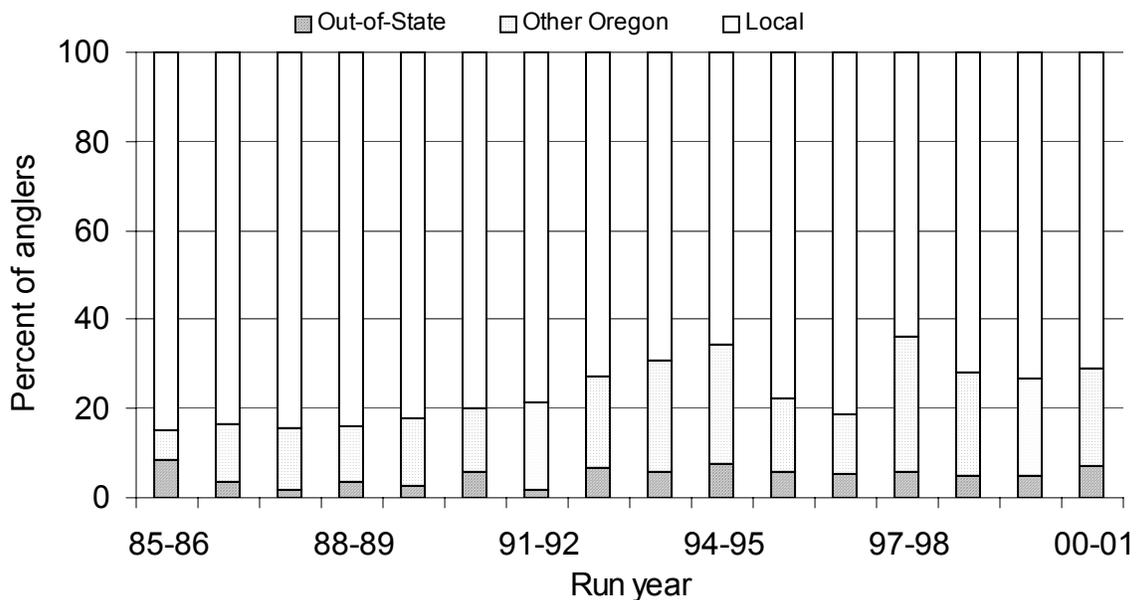


Figure 10. Percent of local (Union or Wallowa county), other Oregon county, and out-of-state anglers that fished in summer steelhead fisheries in the Grande Ronde and Imnaha basins for the 1985-86 to 2000-01 run years.

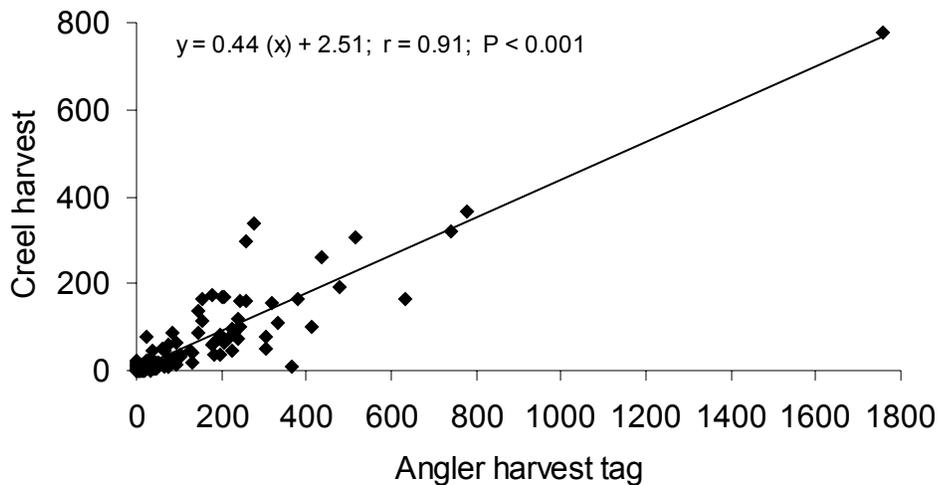


Figure 11. Relationship of angler harvest tag (punch card) and creel survey harvest for summer steelhead fisheries in the Grande Ronde and Imnaha basins for years when harvest estimates for specific reaches were available (1993-1996 for the upper Grande Ronde, Wallowa, and Rondowa, 1992-1993 for Catherine Creek, 1993-2000 for the lower Grande Ronde, and 1986-2000 for the Imnaha fishery areas).

MANAGEMENT IMPLICATIONS AND RECOMMENDATIONS

We observed the highest average catch rate index of six hours per fish in the Grande Ronde Basin fishery on the lower Grande Ronde River for the 2000-01 run year since surveys began in the fall of 1985. Also, the catch rate index in the Imnaha Basin fishery on the Imnaha River of six hours per fish was one of the highest observed since we began surveys. Finally, hatchery fish tend to dominate the catch in these basin fisheries during most of the months surveyed. These fishery statistics help illustrate the success and importance of current hatchery programs in the Grande Ronde and Imnaha basins. We discontinued surveys on Catherine Creek because of the low angler effort expended there and the elimination of hatchery releases of steelhead resulting from the present management program.

Estimates of total harvest and harvest of AdLV+CWT marked steelhead, total catch, and angler effort (in hours) for previous run years (1996-97 to 1999-2000) for spring fisheries are shown in Appendix B. These same estimates for the 2000-01 spring angler surveys will not be available until statewide angler harvest tag data become available (usually a two-year delay).

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APPENDIX A

Fishery statistics for the 2000-01 run year

Appendix Table A-1. Fishery statistics for summer steelhead on the lower Grande Ronde River during the 2000-01 run year. Statistics include mean estimates \pm 95% confidence intervals. Only adipose fin-clipped fish were harvested. "--" indicates not sampled or undefined.

Month, day type	Sample size		Total hours	Total catch	Total harvest	Catch rate		Angler days
	Days	Anglers				fish/h	h/fish	
September:								
Weekday	6	11	257 \pm 184	76 \pm 36	24 \pm 15	0.298 \pm 0.140	3 \pm 2	48 \pm 34
Weekend	5	19	205 \pm 128	27 \pm 26	7 \pm 11	0.129 \pm 0.125	8 \pm 8	45 \pm 28
Total	11	30	462 \pm 224	103 \pm 44	31 \pm 18	0.223 \pm 0.096	4 \pm 2	93 \pm 45
October:								
Weekday	7	110	2679 \pm 562	273 \pm 77	135 \pm 72	0.102 \pm 0.029	10 \pm 3	501 \pm 105
Weekend	5	93	1700 \pm 261	236 \pm 110	93 \pm 65	0.139 \pm 0.065	7 \pm 3	341 \pm 52
Total	12	203	4379 \pm 620	509 \pm 13	228 \pm 97	0.116 \pm 0.031	9 \pm 2	842 \pm 119
November:								
Weekday	6	68	1439 \pm 502	217 \pm 44	71 \pm 43	0.151 \pm 0.030	7 \pm 1	282 \pm 98
Weekend	5	70	653 \pm 242	52 \pm 31	20 \pm 16	0.080 \pm 0.047	13 \pm 7	155 \pm 57
Total	11	138	2092 \pm 558	269 \pm 53	91 \pm 46	0.129 \pm 0.026	8 \pm 2	437 \pm 117
December:								
Weekday	6	57	895 \pm 459	149 \pm 92	61 \pm 46	0.166 \pm 0.102	6 \pm 4	167 \pm 86
Weekend	4	64	686 \pm 147	69 \pm 38	51 \pm 33	0.100 \pm 0.055	10 \pm 6	174 \pm 37
Total	10	121	1581 \pm 482	218 \pm 99	112 \pm 57	0.137 \pm 0.063	7 \pm 3	341 \pm 104
January:								
Weekday	7	39	519 \pm 172	61 \pm 32	36 \pm 27	0.118 \pm 0.062	8 \pm 4	112 \pm 37
Weekend	5	51	395 \pm 140	51 \pm 18	27 \pm 14	0.129 \pm 0.045	8 \pm 3	87 \pm 31
Total	12	90	914 \pm 222	112 \pm 37	63 \pm 30	0.123 \pm 0.040	8 \pm 3	199 \pm 48
February:								
Weekday	6	126	2579 \pm 905	593 \pm 296	291 \pm 18	0.230 \pm 0.115	4 \pm 2	656 \pm 230
Weekend	5	185	2780 \pm 620	543 \pm 126	261 \pm 89	0.196 \pm 0.045	5 \pm 1	515 \pm 115
Total	11	311	5359 \pm 1097	1136 \pm 14	552 \pm 20	0.212 \pm 0.060	5 \pm 1	1171 \pm 240
March:								
Weekday	7	92	2481 \pm 2106	360 \pm 166	110 \pm 75	0.145 \pm 0.067	7 \pm 3	500 \pm 424
Weekend	5	143	2717 \pm 1217	481 \pm 143	228 \pm 13	0.177 \pm 0.053	6 \pm 2	547 \pm 245
Total	12	235	5198 \pm 2432	841 \pm 219	338 \pm 15	0.162 \pm 0.042	6 \pm 2	1047 \pm 490
April:								
Weekday	3	5	93 \pm 53	37 \pm 16	0	0.396 \pm 0.175	3 \pm 1	38 \pm 22
Weekend	3	11	88 \pm 37	51 \pm 30	2 \pm 3	0.588 \pm 0.345	2 \pm 1	25 \pm 11
Total	6	16	181 \pm 65	88 \pm 34	2 \pm 3	0.489 \pm 0.190	2 \pm 1	63 \pm 23
Grand total	85	1144	20166 \pm 2855	3276 \pm 43	1417 \pm 28	0.163 \pm 0.021	6 \pm 1	4193 \pm 594

Appendix Table A-2. Catch rate for summer steelhead ($\pm 95\%$ confidence intervals) on the upper Grande Ronde River during the 2000-01 run year. Only adipose fin-clipped fish were harvested. "--" indicates not sampled or undefined.

Month, day type	Sample size		Catch rate	
	Days	Anglers	fish/h	h/fish
February:				
Weekday	8	0	--	--
Weekend	6	0	--	--
Total	14	0	--	--
March:				
Weekday	10	26	0.025 \pm 0.052	40 \pm 82
Weekend	6	3	0.000	--
Total	16	29	0.021 \pm 0.044	47 \pm 95
April:				
Weekday	4	19	0.117 \pm 0.143	9 \pm 11
Weekend	5	29	0.034 \pm 0.069	30 \pm 61
Total	9	48	0.078 \pm 0.081	13 \pm 13
Grand total	39	77	0.054 \pm 0.050	18 \pm 17

Appendix Table A-3. Catch rate for summer steelhead ($\pm 95\%$ confidence intervals) at Rondowa during the 2000-01 run year. Only adipose fin-clipped fish were harvested. "--" indicates not sampled or undefined.

Month, day type	Sample size		Catch rate	
	Days	Anglers	fish/h	(h/fish)
February:				
Weekday	4	3	0.083 \pm 0.359	12 \pm 52
Weekend	1	0	--	--
Total	5	3	0.083 \pm 0.359	12 \pm 52
March:				
Weekday	4	6	0.000	--
Weekend	7	15	0.222 \pm 0.213	5 \pm 4
Total	11	21	0.204 \pm 0.198	5 \pm 5
April:				
Weekday	3	5	0.046 \pm 0.127	22 \pm 61
Weekend	3	11	0.201 \pm 0.162	5 \pm 4
Total	6	16	0.150 \pm 0.113	7 \pm 5
Grand total	22	40	0.174 \pm 0.110	6 \pm 4

Appendix Table A-4. Catch rate for summer steelhead ($\pm 95\%$ confidence intervals) on the Wallowa River during the 2000-01 run year. Only adipose fin-clipped fish were harvested. "--" indicates not sampled or undefined.

Month, day type	Sample size		Catch rate	
	Days	Anglers	fish/h	(h/fish)
February:				
Weekday	8	10	0.000	--
Weekend	6	72	0.013 \pm 0.018	76 \pm 106
Total	14	82	0.012 \pm 0.017	83 \pm 116
March:				
Weekday	8	284	0.140 \pm 0.052	7 \pm 3
Weekend	9	463	0.080 \pm 0.022	12 \pm 3
Total	17	747	0.103 \pm 0.024	10 \pm 2
April:				
Weekday	3	86	0.087 \pm 0.055	12 \pm 7
Weekend	5	208	0.085 \pm 0.027	12 \pm 4
Total	8	294	0.085 \pm 0.024	12 \pm 3
Grand total	39	1123	0.094 \pm 0.018	11 \pm 2

Appendix Table A-5. Fishery statistics for summer steelhead in Section 2 (mouth to Fence Creek) on the Imnaha River during the 2000-01 run year. Statistics include mean estimates $\pm 95\%$ confidence intervals. Only adipose fin-clipped fish were harvested. "--" indicates not sampled or undefined.

Month, day type	Sample size		Total Hours	Total catch	Total harvest	Catch rate		Angler Days
	Days	Anglers				fish/h	h/fish	
February:								
Weekday	6	12	102 \pm 91	7 \pm 12	3	0.066 \pm 0.070	15 \pm 16	33 \pm 29
Weekend	5	38	241 \pm 45	16 \pm 16	5 \pm 5	0.066 \pm 0.042	15 \pm 10	62 \pm 12
Total	11	50	343 \pm 102	23 \pm 20	8 \pm 5	0.066 \pm 0.036	15 \pm 8	95 \pm 28
March:								
Weekday	8	79	957 \pm 408	159 \pm 74	50 \pm 26	0.167 \pm 0.056	6 \pm 2	214 \pm 91
Weekend	6	110	699 \pm 195	81 \pm 36	25 \pm 13	0.116 \pm 0.030	9 \pm 2	164 \pm 46
Total	14	189	1656 \pm 452	240 \pm 82	75 \pm 29	0.145 \pm 0.035	7 \pm 2	378 \pm 103
April:								
Weekday	4	18	156 \pm 95	68 \pm 30	8 \pm 5	0.431 \pm 0.148	2 \pm 1	45 \pm 27
Weekend	4	74	453 \pm 94	160 \pm 65	6 \pm 3	0.353 \pm 0.064	3 \pm 1	93 \pm 19
Total	8	92	609 \pm 134	228 \pm 71	14 \pm 6	0.373 \pm 0.061	3 \pm 1	138 \pm 30
Grand total	33	331	2608 \pm 483	491 \pm 111	97 \pm 30	0.188 \pm 0.027	5 \pm 1	611 \pm 113

Appendix Table A-6. Fishery statistics for summer steelhead in Section 1 (Fence Creek to town of Imnaha) on the Imnaha River during the 2000-01 run year. Statistics include mean estimates \pm 95% confidence intervals. Only adipose fin-clipped fish were harvested. "--" indicates not sampled or undefined.

Month, day type	Sample size		Total hours	Total catch	Total harvest	Catch rate		Angler days
	Days	Anglers				fish/h	h/fish	
February:								
Weekday	6	2	22 \pm 36	0	--	--	--	15 \pm 25
Weekend	5	1	5 \pm 7	0	--	--	--	3 \pm 4
Total	11	3	27 \pm 37	0	--	--	--	18 \pm 25
March:								
Weekday	8	4	49 \pm 51	0	--	--	--	33 \pm 34
Weekend	6	6	32 \pm 23	0	--	--	--	21 \pm 15
Total	14	10	81 \pm 56	0	--	--	--	54 \pm 37
April:								
Weekday	4	3	15 \pm 14	0	--	--	--	10 \pm 9
Weekend	4	2	16 \pm 8	1 \pm 2	0	0.080 \pm 0.029	13 \pm 5	11 \pm 6
Total	8	5	31 \pm 16	1 \pm 2	0	0.040 \pm 0.014	25 \pm 9	21 \pm 11
Grand total	33	18	139 \pm 69	1 \pm 2	0	0.009 \pm 0.003	111 \pm 37	93 \pm 46

Appendix Table A-7. Percent of the catch that were hatchery summer steelhead during each survey month in the Grande Ronde and Imnaha basins during the 2000-01 run year. Total catch for the Lower Grande Ronde and Imnaha rivers and sampled catch for the Upper Grande Ronde and Willowa rivers and Rondowa are shown in parentheses. On the Imnaha River, Section 2 is from the mouth upstream to Fence Creek, and Section 1 is from Fence Creek upstream to the town of Imnaha. "--" indicates not sampled or undefined.

Creel survey Area	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr
Lower GR River	30(103)	62(509)	55(269)	60(217)	75(112)	71(1137)	61(841)	2(88)
Upper GR River	--	--	--	--	--	--(0)	0(1)	80(5)
Rondowa	--	--	--	--	--	100(1)	89(18)	70(10)
Willowa River	--	--	--	--	--	50(2)	83(234)	69(71)
Imnaha River (Section 2)	--	--	--	--	--	39(23)	51(240)	23(228)

Imnaha River (Section 1)	--	--	--	--	--	--(0)	--(0)	0(1)
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APPENDIX B

Fishery statistics for spring fisheries for the 1996-97 to 1999-2000 run years

Appendix Table B-1. Estimated harvest of summer steelhead and observed and expanded harvest of AdLV+CWT marked steelhead in spring fisheries in the Grande Ronde and Imnaha basins for the 1996-97 run year. Total harvest = 0.436 (harvest card) + 2.51. Sample rate expansion = total harvest/sampled fish. A sample rate expansion of 25 or greater was considered unreliable, therefore expanded equals observed. Harvest estimates made only for months when steelhead angling season was open (Sept - April) and angler harvest card data was greater than zero. Does not include the lower Grande Ronde (location code 231) fishery. "--" indicates not sampled or undefined.

Basin, fishery, location code, statistics, tagcode	Fishery statistics and number of tags recovered by month									Expanded tags
	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	Total	
Grande Ronde Basin										
Upper Grande Ronde (233)										
Angler harvest cards	0	0	0	0	3	20	100	97		
Total harvest	--	--	--	--	4	11	46	45	106	
Catherine Creek (120)										
Angler harvest cards	22	0	0	0	0	0	43	87		
Total harvest	12	--	--	--	--	--	21	40	73	
Rondowa (234)										
Angler harvest cards	0	7	0	18	10	304	391	231		
Total harvest	--	6	--	10	7	135	173	103	434	
Wallowa (235)										
Angler harvest cards	0	0	7	0	17	241	836	425		
Sampled fish	0	0	0	0	0	23	54	36		
Total harvest	--	--	6	--	10	108	367	188	679	
Sample rate expansion	--	--	--	--	--	4.7	6.8	5.2		
075825						1	1	--	2	12
070920						0	1	4	5	28
070326						0	2	1	3	19
075824						0	2	1	3	19
Wenaha (184)										
Angler harvest cards	0	0	0	0	3	0	0	0		
Total harvest	--	--	--	--	4	--	--	--	4	
Middle Grande Ronde (232)										
Angler harvest cards	0	0	0	0	3	23	60	40		
Total harvest	--	--	--	--	4	13	29	20	66	
Imnaha Basin										
Imnaha (144)										
Angler harvest cards	32	40	7	14	37	177	294	261		
Sampled fish	0	0	0	0	0	6	26	24		
Total harvest	16	20	6	9	19	80	131	116	397	
Sample rate expansion	--	--	--	--	--	13.3	5.0	4.8		
075821						0	2	1	3	15
070322						0	1	1	2	10
075820						0	1	0	1	5
070919						0	1	0	1	5
232356						0	0	1	1	5
Total Grande Ronde harvest (excluding lower Grande Ronde)									1362	
Total Imnaha harvest									397	

Appendix Table B-2. Estimated harvest of summer steelhead and observed and expanded harvest of AdLV+CWT marked steelhead in spring fisheries in the Grande Ronde and Imnaha basins for the 1997-98 run year. Total harvest = 0.436 (harvest card) + 2.51. Sample rate expansion = total harvest/sampled fish. A sample rate expansion of 25 or greater was considered unreliable, therefore expanded equals observed. Harvest estimates made only for months when steelhead angling season was open (Sept - April) and angler harvest card data was greater than zero. Does not include the lower Grande Ronde (location code 231) fishery. "--" indicates not sampled or undefined.

Basin, fishery, location code, statistics, tagcode	Fishery statistics and number of tags recovered by month									Expanded tags
	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	Total	
Grande Ronde Basin										
Upper Grande Ronde (233)										
Angler harvest cards	0	0	0	0	0	11	80	149		
Total harvest	--	--	--	--	--	7	37	67	111	
Catherine Creek (120)										
Angler harvest cards	0	0	0	0	0	4	40	40		
Total harvest	--	--	--	--	--	4	20	20	44	
Rondowa (234)										
Angler harvest cards	3	0	17	7	26	390	816	379		
Sampled fish	0	0	0	0	0	6	7	0		
Total harvest	4	--	10	6	14	173	358	168	733	
Sample rate expansion	--	--	--	--	--	28.8	51.1	--		
071159							1		1	1
Wallowa (235)										
Angler harvest cards	7	7	17	7	4	126	1592	805		
Sampled fish	0	0	0	0	0	22	165	117		
Total harvest	6	6	10	6	4	57	697	353	1139	
Sample rate expansion	--	--	--	--	--	2.6	4.2	3.0		
071162						1	6	2	9	34
071161						0	1	2	3	10
071159						0	4	5	9	32
075824						0	2	0	2	8
071163						0	1	0	1	4
071216						0	1	2	3	10
070920						0	3	2	5	19
071160						0	4	4	8	29
075825						0	2	2	4	14
Wenaha (184)										
Angler harvest cards	0	0	0	0	0	0	0	7		
Total harvest	--	--	--	--	--	--	--	6	6	
Middle Grande Ronde (232)										
Angler harvest cards	3	7	23	43	7	117	189	69		
Total harvest	4	6	13	21	6	54	85	33	222	
Imnaha Basin										
Imnaha (144)										
Angler harvest cards	7	70	37	10	36	124	277	277		
Sampled fish	0	0	0	0	0	0	6	8		
Total harvest	6	33	19	7	18	57	123	123	386	
Sample rate expansion	--	--	--	--	--	--	20.5	15.4		
071217							1	0	1	21
Total Grande Ronde harvest (excluding lower Grande Ronde)									2255	
Total Imnaha harvest									386	

Appendix Table B-3. Estimated harvest of summer steelhead and observed and expanded harvest of AdLV+CWT marked steelhead in spring fisheries in the Grande Ronde Basin for the 1998-99 run year. Total harvest = 0.436 (harvest card) + 2.51. Sample rate expansion = total harvest/sampled fish. A sample rate expansion of 25 or greater was considered unreliable, therefore expanded equals observed. Harvest estimates made only for months when steelhead angling season was open (Sept - April) and angler harvest card data was greater than zero. Does not include the lower Grande Ronde (location code 231) fishery. "--" indicates not sampled or undefined.

Fishery, location code, statistics, tagcode	Fishery statistics and number of tags recovered by month									Expanded tags
	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	Total	
Upper Grande Ronde (233)										
Angler harvest cards	0	4	0	0	0	8	71	134		
Total harvest	--	4	--	--	--	6	33	61	104	
Catherine Creek (120)										
Angler harvest cards	0	0	0	0	0	0	8	35		
Total harvest	--	--	--	--	--	--	6	18	24	
Rondowa (234)										
Angler harvest cards	0	0	0	0	32	91	335	166		
Total harvest	--	--	--	--	16	42	149	75	282	
Wallowa (235)										
Angler harvest cards	0	0	0	4	4	55	662	323		
Sampled fish	0	0	0	0	0	3	39	28		
Total harvest	--	--	--	4	4	26	291	143	468	
Sample rate expansion	--	--	--	--	--	8.7	7.5	5.1		
091826						0	1	0	1	7
075330						0	1	0	1	7
091827						0	4	0	4	30
071159						0	1	0	1	7
071162						0	1	0	1	7
Wenaha (184)										
Angler harvest cards	0	0	0	0	0	0	0	4		
Total harvest	--	--	--	--	--	--	--	4	4	
Middle Grande Ronde (232)										
Angler harvest cards	0	0	4	11	20	16	35	71		
Total harvest	--	--	4	7	11	9	18	33	82	
Total Grande Ronde harvest (excluding lower Grande Ronde)									964	

Appendix Table B-4. Estimated harvest of summer steelhead and observed and expanded harvest of AdLV+CWT marked steelhead in spring fisheries in the Grande Ronde Basin for the 1999-2000 run year. Total harvest = 0.436 (harvest card) + 2.51. Sample rate expansion = total harvest/sampled fish. A sample rate expansion of 25 or greater was considered unreliable, therefore expanded equals observed. Harvest estimates made only for months when steelhead angling season was open (Sept - April) and angler harvest card data was greater than zero. Does not include the lower Grande Ronde (location code 231) fishery. "--" indicates not sampled or undefined.

Fishery, location code, statistics, tagcode	Fishery statistics and number of tags recovered by month									Expanded tags
	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	Total	
Upper Grande Ronde (233)										
Angler harvest cards	0	12	4	4	0	35	114	8		
Total harvest	--	8	4	4	--	18	52	6	92	
Catherine Creek (120)										
Angler harvest cards	0	0	0	0	0	0	8	0		
Total harvest	--	--	--	--	--	--	6	--	6	
Rondowa (234)										
Angler harvest cards	4	8	0	0	8	146	292	55		
Total harvest	4	6	--	--	6	66	130	26	238	
Wallowa (235)										
Angler harvest cards	8	12	0	0	0	39	524	75		
Sampled fish	0	0	0	0	0	6	66	18		
Total harvest	6	8	--	--	--	20	231	35	300	
Sample rate expansion	--	--	--	--	--	3.3	3.5	1.9		
091827						1	2	0	3	10
092327						0	2	1	3	9
092331						0	2	2	4	11
091825						0	2	0	2	7
075330						0	1	0	1	4
091826						0	1	1	2	5
092325						0	1	0	1	4
092326						0	0	1	1	2
Wenaha (184)										
Angler harvest cards	0	0	0	0	0	4	0	0		
Total harvest	--	--	--	--	--	4	--	--	4	
Middle Grande Ronde (232)										
Angler harvest cards	12	8	4	4	0	32	67	4		
Total harvest	8	6	4	4	--	16	32	4	74	
Total Grande Ronde harvest (excluding lower Grande Ronde)									714	

Appendix Table B-5. Estimated catch of summer steelhead in spring fisheries in the Grande Ronde and Imnaha basins for the 1996-97 run year. Total catch = (sampled catch/sample harvest) x total harvest. For months with little or no sampling, the average proportion was used. For areas with little or no sampling, data from the survey in closest proximity was used. Does not include the lower Grande Ronde fishery. "--" indicates not sampled or undefined.

Basin, fishery ^a , statistics	Fishery statistics by month								
	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	Total
Grande Ronde Basin									
Upper Grande Ronde									
Sampled harvest	--	--	--	--	--	0	2	6	8
Sampled catch	--	--	--	--	--	1	3	12	16
Total harvest	--	--	--	--	4	11	46	45	106
Total catch	--	--	--	--	8	22	69	90	189
Catherine Creek									
Sampled harvest	--	--	--	--	--	0	0	1	1
Sampled catch	--	--	--	--	--	0	0	1	1
Total harvest	12	--	--	--	--	--	21	40	73
Total catch	12	--	--	--	--	--	21	40	73
Rondowa									
Sampled harvest	--	--	--	--	--	--	--	--	--
Sampled catch	--	--	--	--	--	--	--	--	--
Total harvest	--	6	--	10	7	135	173	103	434
Total catch	--	11	--	18	12	241	320	169	771
Wallowa									
Sampled harvest	--	--	--	--	--	23	54	36	113
Sampled catch	--	--	--	--	--	41	100	59	200
Total harvest	--	--	6	--	10	108	367	188	679
Total catch	--	--	11	--	18	193	680	308	1210
Wenaha									
Sampled harvest	--	--	--	--	--	--	--	--	--
Sampled catch	--	--	--	--	--	--	--	--	--
Total harvest	--	--	--	--	4	--	--	--	4
Total catch	--	--	--	--	6	--	--	--	6
Middle Grande Ronde									
Sampled harvest	--	--	--	--	--	--	--	--	--
Sampled catch	--	--	--	--	--	--	--	--	--
Total harvest	--	--	--	--	4	13	29	20	66
Total catch	--	--	--	--	7	23	54	33	117
Imnaha Basin									
Imnaha									
Sampled harvest	--	--	--	--	--	6	26	24	56
Sampled catch	--	--	--	--	--	12	33	58	103
Creel harvest	16	20	6	9	19	80	131	116	397
Total catch	29	37	11	17	35	160	166	280	735
Total Grande Ronde catch (excluding lower Grande Ronde)									2366
Total Imnaha catch									735

^a We used Wallowa data for Rondowa and the middle Grande Ronde, and lower Grande Ronde data (in Flesher et al. 1997) for the Wenaha.

Appendix Table B-6. Estimated catch of summer steelhead in spring fisheries in the Grande Ronde and Imnaha basins for the 1997-98 run year. Total catch = (sampled catch/sample harvest) x total harvest. For months with little or no sampling, the average proportion was used. For areas with little or no sampling, data from the survey in closest proximity was used. Does not include the lower Grande Ronde fishery. "--" indicates not sampled or undefined.

Basin, fishery ^a , statistics	Fishery statistics by month								
	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	Total
Grande Ronde Basin									
Upper Grande Ronde									
Sampled harvest	--	--	--	--	--	0	1	2	3
Sampled catch	--	--	--	--	--	0	6	9	15
Total harvest	--	--	--	--	--	7	37	67	111
Total catch	--	--	--	--	--	35	222	302	559
Catherine Creek									
Sampled harvest	--	--	--	--	--	--	0	1	1
Sampled catch	--	--	--	--	--	--	0	4	4
Total harvest	--	--	--	--	--	4	20	20	44
Total catch	--	--	--	--	--	16	80	80	176
Rondowa									
Sampled harvest	--	--	--	--	--	6	7	--	13
Sampled catch	--	--	--	--	--	10	8	--	18
Total harvest	4	--	10	6	14	173	358	168	733
Total catch	6	--	14	8	19	288	409	233	977
Wallowa									
Sampled harvest	--	--	--	--	--	22	165	117	304
Sampled catch	--	--	--	--	--	37	273	165	475
Total harvest	6	6	10	6	4	57	697	353	1139
Total catch	9	9	16	9	6	96	1153	498	1796
Wenaha									
Sampled harvest	--	--	--	--	--	--	--	--	--
Sampled catch	--	--	--	--	--	--	--	--	--
Total harvest	--	--	--	--	--	--	--	6	6
Total catch	--	--	--	--	--	--	--	12	12
Middle Grande Ronde									
Sampled harvest	--	--	--	--	--	--	--	--	--
Sampled catch	--	--	--	--	--	--	--	--	--
Total harvest	4	6	13	21	6	54	85	33	222
Total catch	6	9	20	33	9	91	141	47	356
Imnaha Basin									
Imnaha									
Sampled harvest	--	--	--	--	--	0	6	8	14
Sampled catch	--	--	--	--	--	2	10	15	27
Total harvest	6	33	19	7	18	57	123	123	386
Total catch	12	64	37	14	35	110	205	231	708
Total Grande Ronde catch (excluding lower Grande Ronde)									3876
Total Imnaha catch									708

^a We used Wallowa data for the middle Grande Ronde, and lower Grande Ronde data (in Flesher et al. 1999) for the Wenaha.

Appendix Table B-7. Estimated catch of summer steelhead in spring fisheries in the Grande Ronde Basin for the 1998-99 run year. Total catch = (sampled catch/sample harvest) x total harvest. For months with little or no sampling, the average proportion was used. For areas with little or no sampling, data from the survey in closest proximity was used. Does not include the lower Grande Ronde fishery. "-" indicates not sampled or undefined.

Fishery ^a , statistics	Fishery statistics by month								
	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	Total
Upper Grande Ronde									
Sampled harvest	--	--	--	--	--	0	0	2	2
Sampled catch	--	--	--	--	--	0	7	15	22
Total harvest	--	4	--	--	--	6	33	61	104
Total catch	--	44	--	--	--	66	363	458	931
Catherine Creek									
Sampled harvest	--	--	--	--	--	0	1	0	1
Sampled catch	--	--	--	--	--	0	3	0	3
Total harvest	--	--	--	--	--	--	6	18	24
Total catch	--	--	--	--	--	--	18	54	72
Rondowa									
Sampled harvest	--	--	--	--	--	--	--	--	--
Sampled catch	--	--	--	--	--	--	--	--	--
Total harvest	--	--	--	--	16	42	149	75	282
Total catch	--	--	--	--	25	71	247	106	449
Wallowa									
Sampled harvest	--	--	--	--	--	22	165	117	304
Sampled catch	--	--	--	--	--	37	273	165	475
Total harvest	--	--	--	4	4	26	291	143	468
Total catch	--	--	--	6	6	44	481	202	739
Wenaha									
Sampled harvest	--	--	--	--	--	--	--	--	--
Sampled catch	--	--	--	--	--	--	--	--	--
Total harvest	--	--	--	--	--	--	--	4	4
Total catch	--	--	--	--	--	--	--	9	9
Middle Grande Ronde									
Sampled harvest	--	--	--	--	--	--	--	--	--
Sampled catch	--	--	--	--	--	--	--	--	--
Total harvest	--	--	--	--	11	9	18	33	71
Total catch	--	--	--	--	17	15	30	47	109
Total Grande Ronde catch (excluding lower Grande Ronde)									2309

^a We used Wallowa data for Rondowa and the middle Grande Ronde, and lower Grande Ronde data (in Flesher et al. 2000) for the Wenaha.

Appendix Table B-8. Estimated catch of summer steelhead in spring fisheries in the Grande Ronde Basin for the 1999-2000 run year. Total catch = (sampled catch/sample harvest) x total harvest. For months with little or no sampling, the average proportion was used. For areas with little or no sampling, data from the survey in closest proximity was used. Does not include the lower Grande Ronde fishery. "-" indicates not sampled or undefined.

Fishery ^a , statistics	Fishery statistics by month								
	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	Total
Upper Grande Ronde									
Sampled harvest	--	--	--	--	--	0	4	0	4
Sampled catch	--	--	--	--	--	0	7	1	8
Total harvest	--	8	4	4	--	18	52	6	92
Total catch	--	16	8	8	--	36	91	12	171
Catherine Creek									
Sampled harvest	--	--	--	--	--	0	0	0	0
Sampled catch	--	--	--	--	--	0	0	0	0
Total harvest	--	--	--	--	--	--	6	--	6
Total catch	--	--	--	--	--	--	11	--	11
Rondowa									
Sampled harvest	--	--	--	--	--	1	6	0	7
Sampled catch	--	--	--	--	--	3	22	0	25
Total harvest	4	6	--	--	6	66	130	26	238
Total catch	14	21	--	--	21	198	477	93	824
Wallowa									
Sampled harvest	--	--	--	--	--	6	66	18	90
Sampled catch	--	--	--	--	--	10	114	34	158
Total harvest	6	8	--	--	--	20	231	35	300
Total catch	11	14	--	--	--	33	399	66	523
Wenaha									
Sampled harvest	--	--	--	--	--	--	--	--	--
Sampled catch	--	--	--	--	--	--	--	--	--
Total harvest	--	--	--	--	--	4	--	--	4
Total catch	--	--	--	--	--	10	--	--	10
Middle Grande Ronde									
Sampled harvest	--	--	--	--	--	--	--	--	--
Sampled catch	--	--	--	--	--	--	--	--	--
Total harvest	8	6	4	4	--	16	32	4	74
Total catch	14	11	7	7	--	27	55	8	129
Total Grande Ronde catch (excluding lower Grande Ronde)									1668

^a We used upper Grande Ronde data for Catherine Creek, Wallowa data for the middle Grande Ronde, and lower Grande Ronde data (in Flesher et al. 2001) for the Wenaha.

Appendix Table B-9. Estimated angler effort (in hours) for summer steelhead in spring fisheries in the Grande Ronde and Imnaha basins for the 1996-97 run year. Angler effort in hours = Total catch/sampled catch rate in fish per hour. For months with little or no sampling, the average proportion was used. For areas with little or no sampling, data from the survey in closest proximity was used. Does not include the lower Grande Ronde fishery. "--" indicates not sampled or undefined.

Basin, fishery ^a , statistics	Fishery statistics by month								
	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	Total
Grande Ronde Basin									
Upper Grande Ronde									
Catch rate	--	--	--	--	--	0.027	0.032	0.080	0.057
Total catch	--	--	--	--	8	22	69	90	189
Angler effort	--	--	--	--	140	815	2156	1125	4236
Catherine Creek									
Catch rate	--	--	--	--	--	--	--	0.042	0.030
Total catch	12	--	--	--	--	--	21	40	73
Angler effort	400	--	--	--	--	--	700	952	2052
Rondowa									
Catch rate	--	--	--	--	--	--	--	--	--
Total catch	--	11	--	18	12	241	320	169	771
Angler effort	--	145	--	237	158	3951	3902	2061	10454
Wallowa									
Catch rate	--	--	--	--	--	0.061	0.082	0.082	0.076
Total catch	--	--	11	--	18	193	680	308	1210
Angler effort	--	--	145	--	237	3164	8293	3756	15595
Wenaha									
Catch rate	--	--	--	--	--	--	--	--	--
Total catch	--	--	--	--	6	--	--	--	6
Angler effort	--	--	--	--	45	--	--	--	45
Middle Grande Ronde									
Catch rate	--	--	--	--	--	--	--	--	--
Total catch	--	--	--	--	7	23	54	33	117
Angler effort	--	--	--	--	92	377	659	402	1530
Imnaha Basin									
Imnaha									
Catch rate	--	--	--	--	--	0.080	0.104	0.291	0.155
Total catch	29	37	11	17	35	160	166	280	735
Angler effort	187	239	71	110	226	2000	1596	962	5391
Total Grande Ronde angler effort (excluding lower Grande Ronde)									33912
Total Imnaha angler effort									5391

^a We used Wallowa data for Rondowa and the middle Grande Ronde, and lower Grande Ronde data (in Flesher et al. 1997) for the Wenaha.

Appendix Table B-10. Estimated angler effort (in hours) for summer steelhead in spring fisheries in the Grande Ronde and Imnaha basins for the 1997-98 run year. Angler effort in hours = Total catch/sampled catch rate in fish per hour. For months with little or no sampling, the average proportion was used. For areas with little or no sampling, data from the survey in closest proximity was used. Does not include the lower Grande Ronde fishery. "--" indicates not sampled or undefined.

Basin, fishery ^a , statistics	Fishery statistics by month								
	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	Total
Grande Ronde Basin									
Upper Grande Ronde									
Catch rate	--	--	--	--	--	0.000	0.084	0.080	0.078
Total catch	--	--	--	--	--	35	222	302	559
Angler effort	--	--	--	--	--	449	2643	3775	6867
Catherine Creek									
Catch rate	--	--	--	--	--	--	0.000	0.202	0.141
Total catch	--	--	--	--	--	16	80	80	176
Angler effort	--	--	--	--	--	113	567	396	1076
Rondowa									
Catch rate	--	--	--	--	--	0.075	0.123	--	0.091
Total catch	6	--	14	8	19	288	409	233	977
Angler effort	66	--	154	88	209	3840	3325	2560	10242
Wallowa									
Catch rate	--	--	--	--	--	0.047	0.112	0.097	0.096
Total catch	9	9	16	9	6	96	1153	498	1796
Angler effort	94	94	167	94	63	2043	10295	5134	17984
Wenaha									
Catch rate	--	--	--	--	--	--	--	--	--
Total catch	--	--	--	--	--	--	--	12	12
Angler effort	--	--	--	--	--	--	--	87	87
Middle Grande Ronde									
Catch rate	--	--	--	--	--	--	--	--	--
Total catch	6	9	20	33	9	91	141	47	356
Angler effort	63	94	208	344	94	1936	1259	485	4483
Imnaha Basin									
Imnaha									
Catch rate	--	--	--	--	--	0.043	0.068	0.052	0.056
Total catch	12	64	37	14	35	110	205	231	708
Angler effort	214	1143	661	250	625	2558	3015	4442	12908
Total Grande Ronde angler effort (excluding lower Grande Ronde)									40739
Total Imnaha angler effort									12908

^a We used Wallowa data for the middle Grande Ronde, and lower Grande Ronde data (in Flesher et al. 1999) for the Wenaha.

Appendix Table B-11. Estimated angler effort (in hours) for summer steelhead in spring fisheries in the Grande Ronde Basin for the 1998-99 run year. Angler effort in hours = Total catch/sampled catch rate in fish per hour. For months with little or no sampling, the average proportion was used. For areas with little or no sampling, data from the survey in closest proximity was used. Does not include the lower Grande Ronde fishery. "--" indicates not sampled or undefined.

Fishery ^a , statistics	Fishery statistics by month								
	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	Total
Upper Grande Ronde									
Catch rate	--	--	--	--	--	0.000	0.037	0.080	0.052
Total catch	--	44	--	--	--	66	363	458	931
Angler effort	--	846	--	--	--	1269	9811	5725	17651
Catherine Creek									
Catch rate	--	--	--	--	--	--	0.144	0.000	0.072
Total catch	--	--	--	--	--	--	18	54	72
Angler effort	--	--	--	--	--	--	125	750	875
Rondowa									
Catch rate	--	--	--	--	--	--	--	--	--
Total catch	--	--	--	--	25	71	247	106	449
Angler effort	--	--	--	--	455	3381	3984	1797	9617
Wallowa									
Catch rate	--	--	--	--	--	0.021	0.062	0.059	0.055
Total catch	--	--	--	6	6	44	481	202	739
Angler effort	--	--	--	109	109	2095	7758	3424	13495
Wenaha									
Catch rate	--	--	--	--	--	--	--	--	--
Total catch	--	--	--	--	--	--	--	9	9
Angler effort	--	--	--	--	--	--	--	150	150
Middle Grande Ronde									
Catch rate	--	--	--	--	--	--	--	--	--
Total catch	--	--	--	--	17	15	30	47	109
Angler effort	--	--	--	--	309	714	484	797	2304
Total Grande Ronde angler effort (excluding lower Grande Ronde)									44092

^a We used Wallowa data for Rondowa and the middle Grande Ronde, and lower Grande Ronde data (in Flesher et al. 2000) for the Wenaha.

Appendix Table B-12. Estimated angler effort (in hours) for summer steelhead in spring fisheries in the Grande Ronde Basin for the 1999-2000 run year. Angler effort in hours = Total catch/sampled catch rate in fish per hour. For months with little or no sampling, the average proportion was used. For areas with little or no sampling, data from the survey in closest proximity was used. Does not include the lower Grande Ronde fishery. "--" indicates not sampled or undefined.

Fishery ^a , statistics	Fishery statistics by month								
	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	Total
Upper Grande Ronde									
Catch rate	--	--	--	--	--	0.000	0.055	0.021	0.040
Total catch	--	16	8	8	--	36	91	12	171
Angler effort	--	400	200	200	--	900	1655	571	3926
Catherine Creek									
Catch rate	--	--	--	--	--	--	0.000	0.000	0.000
Total catch	--	--	--	--	--	--	11	--	11
Angler effort	--	--	--	--	--	--	200	--	200
Rondowa									
Catch rate	--	--	--	--	--	0.095	0.147	0.000	0.120
Total catch	14	21	--	--	21	198	477	93	824
Angler effort	117	175	--	--	175	2084	3245	775	6571
Wallowa									
Catch rate	--	--	--	--	--	0.018	0.066	0.083	0.059
Total catch	11	14	--	--	--	33	399	66	523
Angler effort	186	237	--	--	--	1833	6045	795	9096
Wenaha									
Catch rate	--	--	--	--	--	--	--	--	--
Total catch	--	--	--	--	--	10	--	--	10
Angler effort	--	--	--	--	--	114	--	--	114
Middle Grande Ronde									
Catch rate	--	--	--	--	--	--	--	--	--
Total catch	14	11	7	7	--	27	55	8	129
Angler effort	237	186	119	119	--	1500	833	96	3090
Total Grande Ronde angler effort (excluding lower Grande Ronde)									22997

^a We used upper Grande Ronde data for Catherine Creek, Wallowa data for the middle Grande Ronde, and lower Grande Ronde data (in Flesher et al. 2001) for the Wenaha.